Suzanne Peerin
CY-B526

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April 12, 2004

VIA ELECTRONIC FILING

Marlene H Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RECEIVED

MAY 24 2004

Federal Communications Commission
Office of the Secretary

Re: ET Dockets 98-153 and 02-380
Critique of Interference Study of
Ultra Wideband Technology

Dear Ms. Dortch·

On February 18, 2004, the Coalition of C-Band Constituents ("Coalition") submitted a study ("Study") conducted by Alion Science and Technology ("Alion") concerning the potential for interference to C-Band satellite earth stations from Ultra-Wideband ("UWB") devices [1] The undersigned companies have analyzed the Study and produced the attached report submitted as Attachment 1 to this letter. Our analysis determined that a significant part of the results and recommendations of the Study are excessively pessimistic due to the unrealistic assumptions used by Alion in the Study When just some of Alion's assumptions are corrected to reflect the real world, Alion's own analysis demonstrates that UWB devices pose no threat of harmful interference to C-band operation

Please do not hesitate to contact us if there are any questions with this submission.

Respectfully submitted,

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Attachment 1

A Critique of the Study and Final Report Titled

Evaluation of UWB and Lower Adjacent Band Interference to C-Band Earth Station Receivers
By Alion Science and Technology

By

The MultiBand OFDM Alliance

Executive Summary

Recently the Coalition of C-Band Constituents ("CCBC") commissioned Alion Science and Technology ("Alion") to conduct a study of possible ultra wideband ("UWB") interference to C-Band satellite systems [1]. Alion concluded that at the present FCC-authorized power levels eventually "the combined effects of UWB devices will overpower C-band reception and render it impossible "

The conclusions of the Alion report are excessively pessimistic due to many unrealistic assumptions Alion used in their study. When some of Alion's assumptions are corrected to reflect the real world, Alion's own analysis demonstrates that UWB devices pose no threat of harmful interference to C-band operation.

This report critically examines the assumptions in the Alion study and provides correction factors to conclusively show that UWB devices do not cause harmful interference to C-band reception. Three examples of these factors are given below.

1 The Alion study does not seem to account for an activity factor, which results in only a few UWB devices operating simultaneously in realistic deployment scenarios. Our activity factor analysis estimates that no more than perhaps 4% of the UWB devices in the field will be transmitting at any one time, based upon targeted current and future application usage models. We conservatively increased this to 10% to account for peak load factors and uncertainties in predictions of the future deployments. **This results in an activity factor correction of at least 10 dB**, or **a factor of 10**.

2 Alion assumes that all of the UWB emitters are suspended in space with a uniform distribution in height between zero and 100 meters. While they assume that roughly 1/3 of these have losses commensurate with urban propagation, they do not include building penetration loss for any of the emitters in their analysis. In reality, the vast majority of UWB devices will be indoors. We make a realistic assumption and place most of these emitters in buildings. We repeated Alion's analysis with 90% of the emitters randomly subjected to a 10 dB building penetration loss. **This results in a correction factor of 7.3 dB to be subtracted from Alion's power levels**.

3. Similarly, Alion used the FCC's peak sidelobe antenna mask (47CFR25.209) for their analysis of received power levels. It is more accurate to use average sidelobe levels, especially when one considers that the analysis is based upon energy impinging upon the satellite receiver antenna from numerous randomly chosen directions. We analyzed a commercially available satellite antenna and formulated a revised sidelobe mask that reflects the average sidelobes as opposed to peak sidelobes. We then repeated Alion's analysis with this antenna, and **obtained a correction factor of 7.4 dB to be subtracted from Alion's power levels.**

Just these three factors alone add up to a 24 7 dB (a scale factor of almost 300) difference between the original Alion results and the results including these realistic, and yet still conservative, factors. According to Alion's own conclusions, this difference is more than

sufficient to mitigate the interference concerns raised in their report, and would be sufficient to support more than 1 million UWB devices in a 5 km radius area. In addition, we show that the Alion report also included unrealistic or overly conservative assumptions about urban canyon path loss models, antenna elevation angles, and frequency loss factors which would further reduce the potential interference levels seen at the C-band receiver The conclusion is clear that there will be no harmful interference caused to C-band receivers, and the FCC should support the current proposed limits for UWB devices

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